

# DRAFT

## Demonstration Hydrogen Fueling Stations Location and Siting Criteria Senate Bill 76

### **Environmental Criteria**

Each SB 76 hydrogen station shall meet or exceed the environmental goals of the California Hydrogen Blueprint Plan, and shall use renewable energy to produce and dispense hydrogen.

- Each station shall use at least 20% new renewable energy to produce and dispense hydrogen with a goal of 33% by 2010.
- The operation of each station will result in a 30% reduction in greenhouse gas emissions relative to comparable emissions from current year gasoline vehicles/stations.
- There shall be no increase in toxic or smog-forming emissions relative to comparable gasoline vehicles/stations.

### **Location Criteria**

These criteria apply to the geographic station locations within the state. Development of the early stages of the California Hydrogen Highway Network will focus on the larger population centers within the State. Regional network clusters are being planned or developed in the larger cities such as San Diego, the Los Angeles basin, Sacramento, San Francisco areas and within the San Joaquin Valley. Draft criteria presented follow:

- The stations should be located in the four existing regional clusters, or a demonstration station/cluster along Interstate-5 or Highway 99 within the San Joaquin Valley.
- Each station location should help maximize the utility, range and usability of the established vehicle fleet operating within that cluster.
- Stations should be located in convenient proximity to the vehicles that will be using the station.
- The stations should be located along or just off of major thoroughfares and highways so drivers do not have to drive too far to refuel.
- If hydrogen is not generated on site, the fueling station should be located as close as practical to the hydrogen generation facility.
- Where possible, station locations should be strategically spaced at convenient intervals within the cluster. Ideal driving distance to the next public station should be approximately 10 miles.

- Where possible, the station should be located where it will receive maximum visibility by the public.
- Station locations should feature anchor tenants that are committed to the project for the long term.

### **Siting Criteria**

These siting criteria deal with the actual layout, appearance and specific capacities of that station.

- All stations must comply with relevant codes, standards, local, state and federal regulations regarding the siting, storage and dispensing of hydrogen fuel (NFPA, CEQA, etc. see list in Implementation Topic Team Report January 5, 2005).
- The station should be sited in convenient proximity to the vehicles that will be using that station.
- Station dispensing equipment should be readily identifiable, safe and easy to use.
- The station must have “public” access. The ultimate goal being an experience similar to that of a gasoline service station.
- Station operators should provide attendants to fuel third party vehicles.
- The station operator will address training and liability agreements to allow National Highway Traffic Safety Administration certified original equipment manufacturer (OEM) and conversion vehicles access to refueling.
- Public access may be limited by a combination personal identification number (PIN), vehicle identification number (VIN) and credit card.
- The station must be open during convenient hours of operation. For example, initially the station should be open, with an available attendant at the station during commute hours, from 6:00 a.m. to 6:00 p.m. generally. If needed, for after-hours operation, an attendant should be available on-call.
- For light duty vehicles, on-site dispensed storage capacity should be no less than 30 kilograms (kg) with enough reserve for emergencies.
- Stations should be capable of dispensing at least 10kg/day.
- The station should be capable of dispensing fuel at 5000 pounds per square inch (psi), with the capability of upgrading to 10,000 psi.
- Fuel should be of adequate quality to satisfy vehicle requirements.
- Station layout should allow for easy ingress and egress.
- California Hydrogen Highway signage should be placed in highly visible locations.
- A public education kiosk containing information about the station, the California Hydrogen Highway, the source of renewables for that station, and a toll free number should be available to users of the station and the general public.
- Upon request, the station should be made available for Hydrogen Highway events and education.

- All fueling/energy stations should provide automatic data collection to record parameters including, but not limited to: energy throughput, energy efficiency, number of fillings, fill rate, hydrogen production rate, renewable percentage, events and alarms, maintenance records, electricity generated, heat generated for building use and emissions monitoring.

### **Siting Criteria - Air Quality and Land Use Planning Handbook**

The Air quality land use handbook presents air quality information on facilities with the potential for causing significant increases in exposure to toxic air pollutants in adjacent areas. Sensitive land use requires special attention because sensitive populations such as children and the elderly are especially vulnerable to the effects of air pollution. The handbook guidelines give siting recommendations for facilities such as rail yards, petroleum refineries, chrome plating facilities, distribution centers, and gasoline dispensing stations for example. Since facilities siting is a local government issue, the handbook guidelines are only recommendations meant to assist authorities in making informed siting decisions.

Hydrogen station operations do not pose health risks on the scale of those listed in the Land Use and Air Quality Handbook. Hydrogen itself has no odor, is not toxic, contains no particulates, and dissipates rapidly. Hydrogen does not pose a risk to groundwater or soil. Electrolytic generation of hydrogen results in no toxic or criteria emissions. Onsite reformation of natural gas can result in minor emissions of oxides of nitrogen and emissions of carbon dioxide, although both can be controlled by selective catalytic reduction and by sequestration. Compared with conventional gasoline stations, hydrogen stations have much lower air quality impacts. The operation of hydrogen fuel cell and internal combustion engine vehicles have even less air quality impacts. Emissions from hydrogen internal combustion engine vehicles consist of trace carbon monoxide and particulate matter from engine lubricants, and low oxides of nitrogen emissions. Hydrogen fuel cell vehicles are certified zero emission vehicles.

Combined air quality risks from on-site emissions of both station and vehicle operations are minimal and suggest that the 50 foot fence line handbook recommendation, used for small capacity gasoline dispensing facilities is adequate, even conservative, for hydrogen fueling facilities. Staff suggests that local planning personnel consider the following recommendations regarding secondary impacts of station siting:

- In such cases where fuel deliveries take place, reduce trucking distribution emissions by recommending that trucks satisfy the cleanest standards.
- To gain early public and community support, station planning should include early proactive opportunities for community involvement and public comment beyond minimum local permitting requirements and the early inclusion of the fire marshal, local business and civic leaders.

- As a California Hydrogen Highway Public Station, operators and their partners are encouraged to make the station available to university, trade, and other schools to train future technicians and engineers in developing hydrogen as a sustainable transportation fuel and offer safety, educational, and technology tours and talks.
- Promote the benefits of a clean, quiet, renewable hydrogen station where vehicle traffic is made up of near-zero and zero emission vehicles.